



**DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

**Permit Application Analysis  
A0000797**

**August 28, 2015**

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<b>NAME OF FIRM:</b>	Wyoming Refining Company
<b>NAME OF FACILITY:</b>	Newcastle Refinery
<b>FACILITY LOCATION:</b>	740 West Main Street Newcastle, Weston County, Wyoming
<b>TYPE OF OPERATION:</b>	Petroleum Refinery
<b>RESPONSIBLE OFFICIAL:</b>	Warren Neufeld VP, Environment & Government Relations
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<b>REVIEWING ENGINEER:</b>	Nick Meeker, Air Quality Engineer

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## **1.0 PURPOSE OF APPLICATION**

On April 17, 2015, the Division of Air Quality received an application from Wyoming Refining Company to modify Tank 47 at the Newcastle Refinery located at 740 West Main Street in Newcastle, Weston County, Wyoming. The modification will consist of converting Tank 47 from an internal floating roof tank used for gasoline service to a fixed roof tank used for diesel service.

## **2.0 PROJECT DESCRIPTION**

Tank 47 is currently out of service because its internal floating roof collapsed. The top portion of Tank 47's wall is distorted and prevents the internal floating roof from traveling the full vertical distance inside the tank. Approximately 23,000 barrels of the tank's estimated 31,000 barrel capacity have been usable, while the remaining capacity has not been usable. Wyoming Refining Company requests to use Tank 47 as a fixed roof tank used for diesel service or a material with vapor pressures less than diesel #1 only. The only structural changes in this project are the dismantling and removal of the current internal floating roof and changes to piping external to the tank so that diesel fuel may be routed into and out of Tank 47. No other changes are proposed to the shell, roof, floor or other parts of Tank 47. In addition, the gasoline formerly routed through Tank 47 is now routed through either Tank 43, 46, 301 or 302. No matter where the gasoline from Tank 47 is being re-routed, the refinery gasoline production will not increase as a result.

### 3.0 ESTIMATED EMISSIONS

Emissions from the Newcastle Refinery will increase as a result of the proposed modification to convert Tank 47 from an internal floating roof tank used for gasoline service to a fixed roof tank used for diesel service. Volatile organic compounds (VOCs) and hazardous air pollutants (HAPs), resulting from standing and working losses, were estimated using AP-42 factors.

Wyoming Refining Company demonstrated the change in VOC and HAP emissions by comparing the highest actual annual emissions reported to the Division (2010 - 2014) to the potential emissions of the modification. Actual emissions during 2011 resulted in 5.0 tpy VOC and 0.2 tpy HAPs. Assuming 220,000 bbls/year and storing #1 diesel, potential emissions after the modification of Tank 47 are estimated to be 7.8 tpy VOC and 0.1 tpy HAPs. Since Tank 47 will not store anything more volatile than diesel #1, the potential emissions represent the worst-case emissions.

Potential emissions associated Tank 47 are listed in Table 3-1.

Table 3-1: Storage Tank Emissions			
Tank ID#	Content	VOC	HAPs
		(tpy)	(tpy)
Pre-Modification			
47	Gasoline <sup>1</sup>	5.0	0.2
Post-Modification			
47	Diesel #1 <sup>2</sup>	7.8	0.1
Change in Emissions		2.8	-0.1

<sup>1</sup> Emissions estimated using actual emissions reported to the Division.

<sup>2</sup> Emissions estimated using AP-42 factors.

### 4.0 CHAPTER 6, SECTION 4 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The Newcastle Refinery is a major stationary source under Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations (WAQSR), as the facility is a named source (petroleum refinery) which emits or has the potential to emit one hundred tons per year or more. The proposed permitting action is not subject to Prevention of Significant Deterioration (PSD) review under Chapter 6, Section 4 of the WAQSR as a physical change in or change in the method of operation at the facility does not result in a significant emission increase of an NSR regulated pollutant, and a significant net emissions increase of that pollutant as described below.

PSD applicability is based on the change in baseline actual emissions to projected actual emissions or baseline actual to potential emissions for affected emission units in comparison to significant emission rates for a given NSR regulated pollutant. The worst-case emission increase in VOC emissions does not meet the definition of a significant emissions increase (40 tpy for VOCs); therefore, a review under Chapter 6, Section 4 of the WAQSR was not required.

Although this modification is not related to the refinery expansion project permitted under Air Quality Permit MD-13335, aggregation with that project's calculated 31.9 tpy net VOC emissions increase would still not result in PSD significance.

## **5.0 CHAPTER 6, SECTION 3 – MAJOR SOURCE APPLICABILITY (TITLE V)**

The Newcastle Refinery is a “major source” as defined by Chapter 6, Section 3 of the WAQSR. Wyoming Refining Company will be required to modify Operating Permit 3-0-136-2A per the requirements of Chapter 6, Section 3 of the WAQSR.

## **6.0 CHAPTER 6, SECTION 2 – BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

A best available control technology (BACT) analysis is required for all new and modified (as defined in Chapter 1, Section 3) emission units under Chapter 6, Section 2.

### **6.1 VOC**

Wyoming Refining Company submitted a BACT cost analysis addressing control of VOC emissions due to standing and working losses from Tank 47. This BACT cost analysis addressed controlling VOC emissions with a vapor combustor.

Wyoming Refining Company contacted a vapor combustor vendor in order to determine an accurate BACT cost analysis. However, the installation estimate did not include sealing the tank, any required emissions monitoring, natural gas costs or operating and maintenance expenses. To address these uncertainties, a twenty-five percent (25%) contingency was added to the capital costs and a one percent (1%) of capital rule of thumb was used to estimate annual operations and maintenance expenses. Wyoming Refining Company's current cost of capital is eight percent (8%), and an assigned fifteen (15) year economic life to the control equipment. The result is an emission control cost of \$7,297 per ton of VOC. To be conservative, one hundred percent (100%) VOC destruction efficiency was assumed. Wyoming Refining Company respectfully submits that, considering these costs, emission controls for diesel storage in Tank 47 are not economically reasonable.

The Division considers the cost effectiveness to control the VOC emissions due to standing and working losses from Tank 47 as being unreasonable. Therefore, the Division will not require Wyoming Refining Company to control the VOC emissions at Tank 47.

## **7.0 NEW SOURCE PERFORMANCE STANDARDS (NSPS)**

40 CFR part 60, subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984* - applies to storage vessels with a design capacity greater than 75 m<sup>3</sup> (471 bbl) containing a volatile organic liquid (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. The subpart does not apply to storage vessels with a capacity greater than or equal to 151 m<sup>3</sup> storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (0.51 psi). The calculated true vapor pressure for #1 diesel at a bulk liquid storage temperature of 75 °F (the average 2014 liquid temperature for Tank 47 was 61°F) is 0.32 psi. Therefore, storing #1 diesel in Tank 47 is not subject to Subpart Kb.

## **8.0 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs)**

The refinery is not a major source of HAPs as defined by the WAQSR, as emissions are less than 10 tpy of any individual HAP, or 25 tpy of any combination of HAPs. Therefore, the refinery is not subject to 40 CFR part 63, Subpart CC - *National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries*. This subpart applies only to major sources of HAPs.

## **9.0 PROPOSED PERMIT CONDITIONS**

The Division proposes to issue an Air Quality Permit to Wyoming Refining Company to modify the Newcastle Refinery with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.
2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.
3. That Wyoming Refining Company shall file a complete application to modify their Operating Permit within twelve (12) months of commencing operation, in accordance with Chapter 6, Section 3(c)(i)(B) of the WAQSR. Where an existing operating permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.
4. That all notifications, reports and correspondence required by this permit shall be submitted to the Stationary Source Compliance Program Manager at 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 2100 West 5<sup>th</sup> Street, Sheridan, WY 82801. Submissions may also be done electronically through <https://airimpact.wyo.gov> to satisfy requirements of this permit.
5. That written notification of the anticipated date of initial startup, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than sixty (60) days or less than thirty (30) days prior to such date. Notification of the actual date of startup is required within fifteen (15) days after startup.
6. That the date of commencement of construction shall be reported to the Administrator within thirty (30) days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within twenty-four (24) months after receipt of such approval or if construction is discontinued for a period of twenty-four (24) months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.

7. That the contents of Tank 47 shall be limited to diesel #1 or material with vapor pressures less than diesel #1. Records documenting material type stored shall be kept for a period of at least five (5) years and shall be made available to the Division upon request.